

Reclaimed Water in Washington State



Washington State

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Reclaimed Water is . . .



Effluent derived in any part from sewage that has been adequately and reliably treated so that it is suitable for a beneficial use

Yelm Fish Pond

. . . No Longer Wastewater

Other Types of Water Reuse

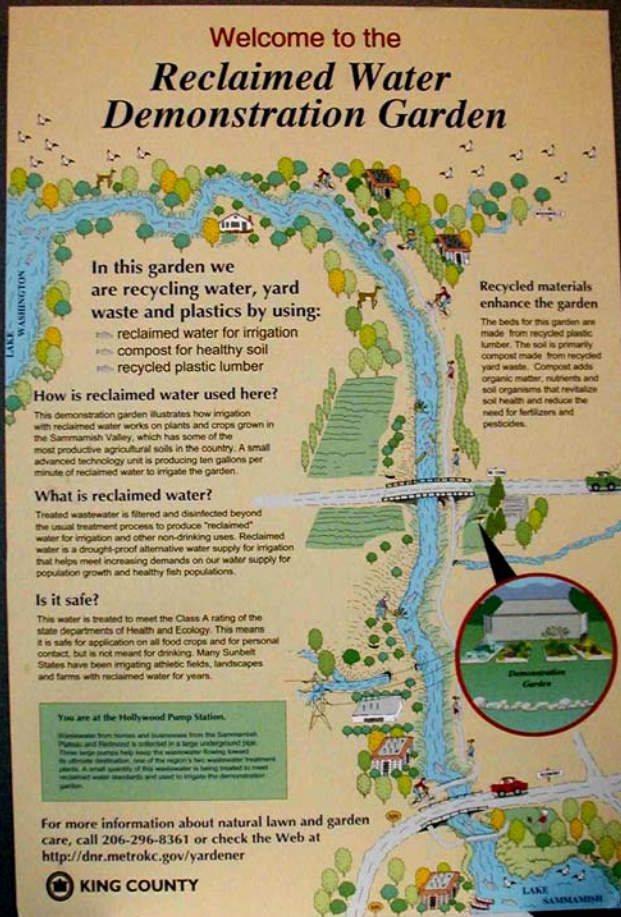
- Greywater Systems
- Agricultural Industrial Process Water
- Industrial Reuse Water

Goals:

- **Encourage and facilitate reclaimed water use**
- **Provide new basic water supplies to meet future water needs**
- **Protect public health and safety**
- **Protect and enhance our environment**
- **Gain public confidence and support in reclaimed water**
- **Find cost-effective solutions**



Implementation Strategies



- Build on knowledge and experience from other states
- Provide state standards, guidance & procedures
- Require consideration in planning
- Regulate through permits
- Simplify water rights
- Develop pilot and demonstration projects
- Provide technical assistance

Washington State Standards

- Standards are in three sections
- General requirements cover most traditional uses and contain definitions for all
- Subsequent sections cover discharge to wetlands and direct groundwater recharge
- All sections have requirements for reliability, storage, monitoring, cross-connection control, signage and markings

Classes of Reclaimed Water

- **Four basic classes of reclaimed water**
 - A, B, C and D
- **All classes use an oxidized wastewater – a minimum of secondary treatment**
- **All require a high level of disinfection**

Class A requires advanced treatment and allows the most uses.

Classes B, C and D are of a lesser quality and have more restrictions on use depending on the potential for human contact.

Class A Reclaimed Water



chemical coagulation

and filtration



Turbidity limits 2 NTU average
 5 NTU maximum

Public Health Protection



- Monitoring of quality
- No bypass allowed - Alternate discharge or storage requirements
- Alarms on key processes
- Restrictions on distribution and use
- Public notification of use
- Cross connection control

Planning and Design

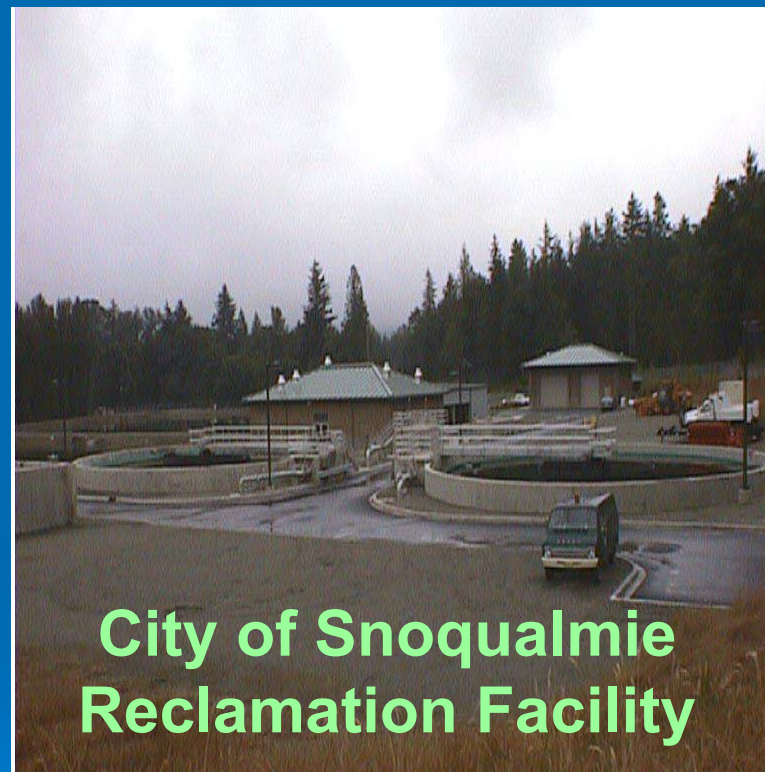
- **Required consideration in sewer plans**
- **Detailed Engineering Report Required**
- **Minimum Design Criteria - Chapter E1- Criteria for Sewage Works Design**
- **Licensed engineer**
- **Approved by Ecology and Health**



One Permit Issued to the Generator

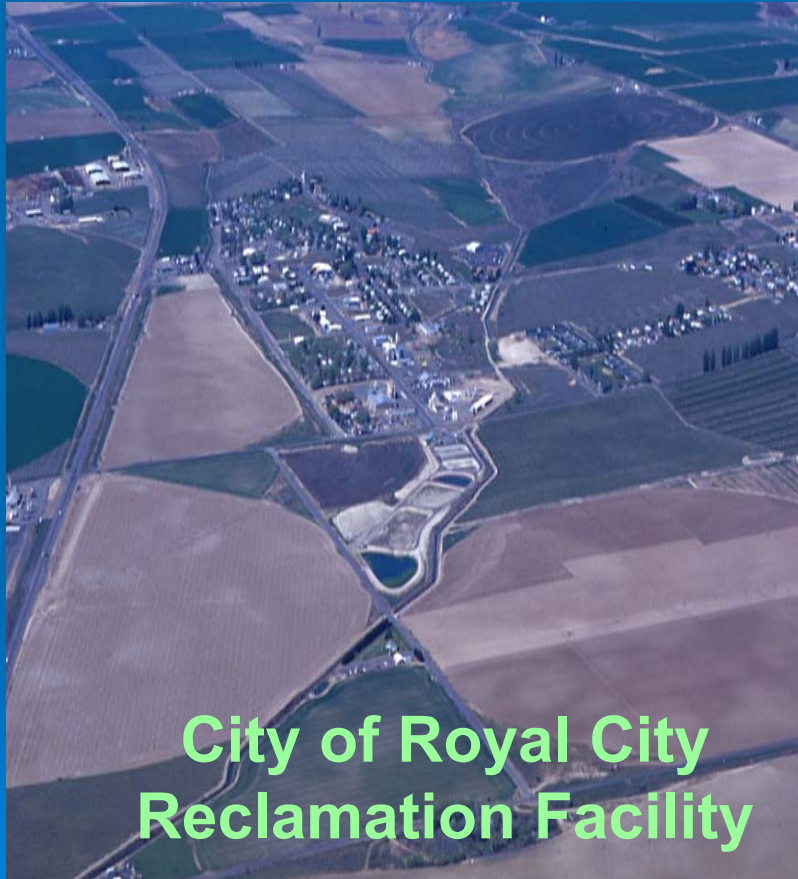
Regulates:

- Source Control
 - (pre-treatment)
- Level of Treatment Required
- Operation/Maintenance
- Monitoring/Reporting
- Distribution
- Use areas



By agency agreement, the permit is issued
through Ecology's permitting authority

Water Rights Simplified

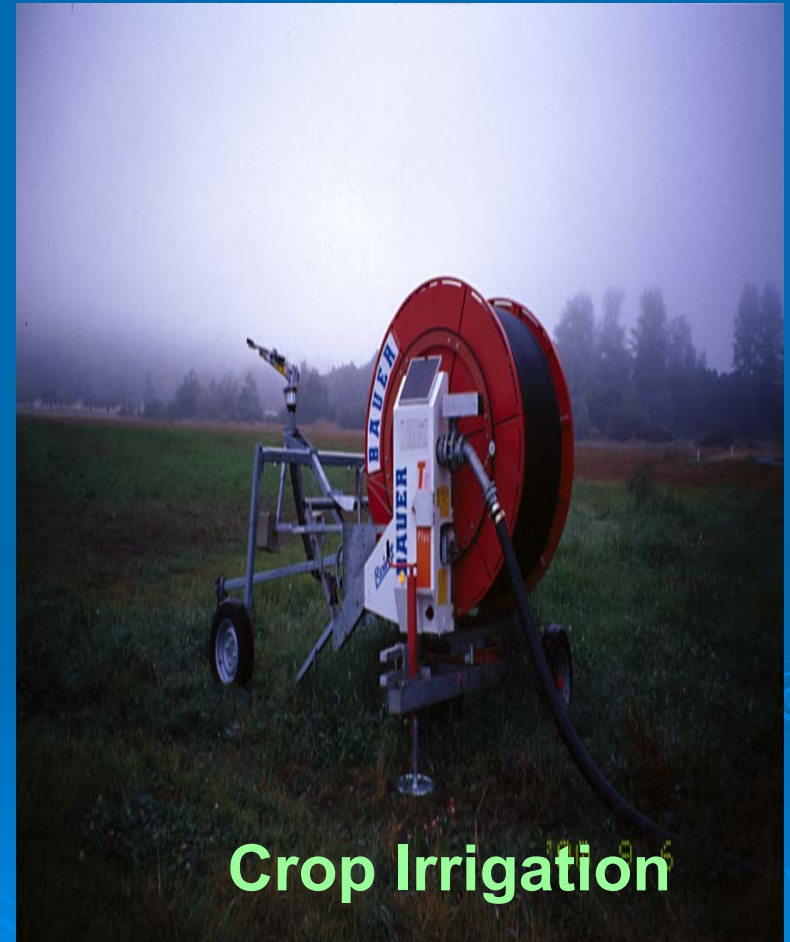


- Reclamation facility owner has exclusive rights to the water
- Use and distribution is exempt from water rights permitting
- Use must not impair downstream rights

Typical Uses -

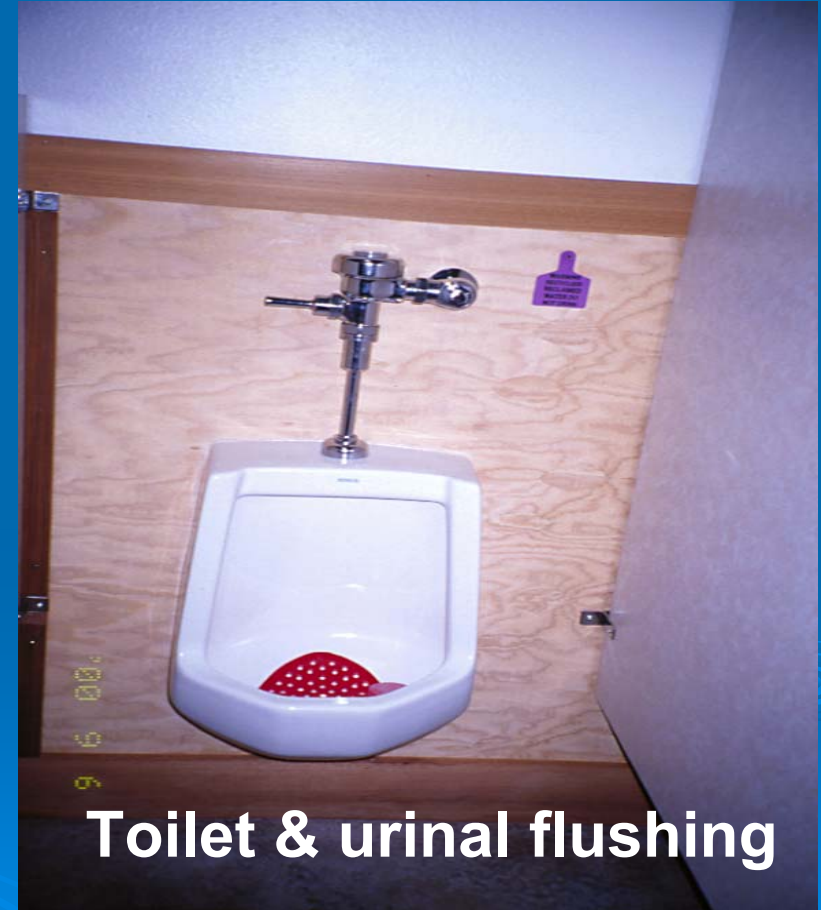


Landscape Irrigation



Crop Irrigation

Commercial/Industrial



Some Uses Require Additional Treatment

- **Wetlands**
 - hydraulics and biological system
- **Stream Augmentation**
 - must also meet surface water standards



Groundwater Recharge

Surface Percolation

- Additional step to reduce nitrogen
- Must meet “Ground Water Recharge Criteria” (state drinking water standards)



Percolation Basins

Direct Aquifer Recharge

- **Non-Potable**
 - $\text{BOD}_5 \leq 5 \text{ mg/L}$
 - $\text{TSS} \leq 5 \text{ mg/L}$
- **Potable**
 - reverse osmosis-treated
 - Meet drinking water criteria and state groundwater standards
 - Turbidity $< 0.1 \text{ NTU}$
 - total nitrogen $< 10 \text{ mg/L}$
 - $\text{TOC} < 1 \text{ mg/L}$
 - 2000 feet from well

Retain underground
at least 12 months



Streamflow Augmentation



**Meet Surface Water
Quality Standards
Chapter 173-201A WAC**

**Note: The project must
also identify a
beneficial use**

Examples



16 Facilities Operating in Washington State

Demonstration Projects:

- ✓ City of Yelm
- ✓ City of Sequim
- ✓ City of Ephrata
- ✓ City of Royal City

City of Ephrata



Reclamation Facility

Class A Water Reclamation Facility

- **\$6.8 million**
- **1.12 MGD**
- **Oxidation Ditch**
- **Upflow Sand Media Filtration System**
- **UV Disinfection**

City of Ephrata

Reclaimed water is used for groundwater recharge - 4 infiltration basins

The facility grounds have a “construction water” truck dispensing station

The Class A water is used for process water, site irrigation and aesthetics



Facility Grounds

City of Royal City



AeroMod Biological Treatment

- **Class A Water Reclamation Facility - 0.25 MGD**
- **\$3.7 million**
- **Package Plant**
- **Disk Fabric Filtration**
- **UV Disinfection**

City of Royal City

**Class A reclaimed water
for groundwater recharge
via three infiltration
basins**

**The reclaimed water is
also used for facility
processes, washdown
and for site irrigation**



Aerial Photo

City of Sequim



Reclamation Facility

- Class A Water Reclamation Facility
- Design 0.67 MGD
- \$5.3 million
- Oxidation Ditch
- Downflow Anthracite Media Filtration
- UV Disinfection.

City of Sequim

- \$3.5 million
- Irrigation
- Wetlands
- Toilet flushing
- Streamflow Augmentation
- City shop
- In Plant Use



Carrie Blake Park

City of Yelm



Yelm Filtration Units

- **Class A Water Reclamation Facility
1.0 MGD**
- **\$9.6 million facility,
distribution and use
area**
- **SBR**
- **Upflow Sand Media
Filtration**
- **Sodium Hypochlorite
Disinfection**

City of Yelm

The showcase of the Yelm project is Cochrane Memorial Park, an aesthetically pleasing constructed wetland park designed to polish the reclaimed water and recharge groundwater.



Cochrane Memorial Park